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The following Table shows the progress and present state of the Society with respect to the number of Fellows :—

	Patron and Royal.	Foreign.	Com- pounders.	£2 12s. annually.	£4 annually.	Total.
November 30, 1866.	5	49	302	3	267	626
Since elected			+6		+10	+16
Since compounded . .			+2		—2	
Since deceased		—1	—12	—1	—11	—25
November 30, 1867.	5	48	298	2	264	617

“Observations on the Anatomy of the Thyroid Body in Man.” By
GEORGE W. CALLENDER, Lecturer on Anatomy at St. Bartho-
lomew’s Hospital. Communicated by JAMES PAGET, Esq. Re-
ceived June 8, 1867*.

By examination of the thyroid body in the fœtus, we learn that it has from an early period, much the same relations and appearances as belong to it in childhood, and during the adult condition, and we observe those diversities of its parts which are exceptionally recognized during the later periods of life. We may thus trace out the origin of such exceptional conditions, and notice, more especially, how the isthmus of Eustachius and the pyramid of Lalouette are connected with the formation of the thyroid, and depend for their after characters upon early changes during development of size.

As I have reason to believe that the formation of the thyroid in man may be fairly reexamined, I shall venture to refer, in the first place, to some of the opinions advanced with regard to its earliest appearances.

The late Mr. Gray† has alluded to the views of Huschke, Arnold, Bischoff, and Goodsir, respecting the development of this body. It is enough for my present purpose to state that Arnold considered the thyroid to be developed from the membranous air-tube, where the larynx is formed, whilst Goodsir‡ thought that it originated in that portion of the membrana intermedia of Reichert which remains in connexion with the anastomosing vessels between the first and second aortic arches, or carotid and

* Read June 20, 1867 : see abstract, p. 24.

† Philosophical Transactions, 1852.

‡ Philosophical Transactions, 1846.

subclavian arteries. At first, he states, no isthmus is observed (in sheep), but presently lateral masses join across and in front of the base of the heart and root of the neck. Then the thyroid separates from the thymus, from which it differs in not being divided into lobules. Simon* has no reason for believing that its origin has any particular relation to that of the thymus. Undoubtedly, he adds, there is a period when it is impossible to say how much of the unshaped blastema of the neck belongs to one organ, how much to another, but so soon as the microscope can discover the first traces of their development, it likewise affords unquestionable evidence of their distinctness, and shows each as separate in itself, and as peculiar in structure, as at any later period of growth.

Handfield Jones† found in a foetal sheep two inches long that the thyroid presented the usual appearance; it possessed an isthmus, and in a human foetus of four months and a half, the isthmus appeared of the same standing as the lateral masses.

The absence of an isthmus in an entire class, that of birds, the observations of Gray on the formation of this body in the chick, and the suggestions of Meckel, Cruveilhier and others, countenance the supposition that the thyroid is developed from two lateral masses.

There are no reliable observations respecting the development of the pyramid, but Haller and Arnold have hazarded the opinion that it is probably the duct of the thyroid during foetal life.

In describing the following dissections, I may state that the specimens were examined as they came into my possession without selection, save for age, so that they may be assumed to represent very fairly the conditions commonly existing during foetal life.

In a human fetus, measuring in length eight-tenths of an inch (between the seventh and eighth week), the thyroid is a body of a pale yellowish colour, lying across the front of the trachea, just below the mass out of which the cartilages of the larynx are being developed. It is closely connected with the trachea and with the lower edge of the larynx, either of which would be torn in endeavouring to remove it, but the thyroid is easily uncovered by stripping off the parts superficial to it, and has no connexion with these or with the thymus (fig. 1)‡. Although consisting at this period of but one piece, the thyroid is deeply notched, and thus looks as though made up of three distinct lobes, one sometimes bifid, in the centre, and this is the smallest, and another on either side elongated and inclined upwards by the side of the larynx. Similar divisions are seen in a foetus measuring two inches and eight-tenths in length (fig. 2)§, the thyroid consisting of three lobes, one being central, a

* Essay on the Thymus Gland, 1845.

† Cyclopædia of Anatomy and Physiology, Art. Thyroid.

‡ This specimen is in the Museum of St. Bartholomew's Hospital.

§ See also specimen No. 1.

second on the right side, measuring one-tenth of an inch from end to end, and a third on the left side, measuring one-fourteenth of an inch.

Relations with the Thymus.

That the connexions of the thyroid are from the first with the larynx and trachea, rather than with the thymus, is rendered more probable by the appearances observed in the young of animals. In a foetal rabbit (fig. 3)*, eight-tenths of an inch long, the thymus may be seen to consist of two lobulated masses, lying side by side just above the heart and its great vessels, broader at the base towards the thorax, diverging a little as they pass upwards, and ending in the root of the neck by a somewhat pointed extremity. The trachea in the middle line is surmounted by the larynx, but at its upper extremity is a minute elevation, contrasting by its pale colour with adjacent parts; and connected with this are two divergent ridges, of the same pale colour, which embrace, horse-shoe fashion, the lower portion of the larynx, tapering as they ascend, and resembling, so far as the mere look is concerned, the division of the trachea at its lower extremity into the two bronchi. In a foetal pig (fig. 4)†, one inch and two-tenths in length, the thyroid is notched below, thus acquiring, though somewhat indistinctly, a three-lobed appearance; and here also, whilst firmly attached to the trachea, it is no way visibly in relation with the thymus.

One cannot but be attracted by this connexion with the trachea, on which tube the thyroid (even if it be not developed from the membranous air-tube) buds and attains some little size, a formation reminding one of that of the lungs coming out from the front wall of the œsophagus, that is, from the trachea, and of the view of Mr. Simon, as afterwards expressed by the editors of Cuvier‡ respecting the thyroid, “C’est la fausse branchie, branchiole des poissons.” Indeed, from its relation to the air-tube during the early period of life, or in fish to the vertebral or hyoid extremity of the gill, from its curious alternation with the supplementary gill of Broussonet§, and from its structure (Kölliker), it may be not inaptly referred to as a pseudo-lung rather than as an associate with the thymus and the so-called ductless glands.

I may add that, in the human foetus, no distinct evidence of the thyroid appears to me to exist before the sixth week, up to which time it cannot, I believe, be isolated from the structures in the front of the neck; it seems to come out from the blastema in the form of a mass in front of the trachea, which quickly acquires an imperfectly lobed condition, but I have not been able to distinguish at any period, during development of size, three completely distinct parts.

* See also specimen No. 8.

† See also specimen No. 9.

‡ *Leçons d’anatomie comparée*, 2^{me} édit. tom viii. 1846, p. 678.

§ Simon, *Philosophical Transactions*, 1844, p. 301.

The Isthmus.

In the dissections already referred to, the presence of a middle portion, and its equal development with the lateral lobes, leads to the inference that this central part is present from the earliest period, and that the thyroid isthmus is not formed by a growing together of two distinct side-pieces. Yet in the human foetus, at four months, Fleischmann and Meckel say that they found, as they described them, two lateral lobes only; and the hare, for example, has been written of as having but two distinct lateral masses, as also were the Cetacea until Professor Turner* explained that the thyroid of a well-grown male porpoise was a single mass extending across the trachea, of which the median portion could hardly be described as an intervening isthmus; for in its supero-inferior diameter it equalled that of the lateral portion. In addition, however, to the dissections already detailed, I have examined the thyroid in foetal hares, and have always found the middle portion equally developed with the side lobes, and bounded by notches, which seem to define it from them (fig. 5). With the growth of this foetus, as also in the young of cats and of dogs, I have observed that the central part appears to flatten and to lose the rounded lobular condition, and sometimes it disappears altogether.

The Lobes.

Whilst, however, three lobes are chiefly indicated, lesser notches may be occasionally seen, and continue to be noticeable as the foetus grows, though they are very irregular and uncertain. Thus in a human foetus, three inches and nine-tenths long, the left lobe (fig. 6)† is divided into two portions by a deep fissure, one-half of it ascending to the left of the middle line in front of the cricoid and thyroid cartilages, and there are other notches faintly outlining a middle lobe. In a foetus four inches and three-tenths long, the middle lobe is bifid, a cleft dividing it above; and in another foetus, four inches and six-tenths long, the entire thyroid is very irregularly formed, broken into several lobes, but still showing at its lower margin a division into three chief portions (figs. 7 & 8)‡. Here also a process ascends, budding out from the left side, tapers almost to a point, and ends by being fixed to the under surface of the os hyoides.

Omitting lesser varieties, I will describe the following. The thyroid from a foetus eight inches and seven-tenths long (fig. 10)§, consists of two chief lobes, which meet, but are not united, in the middle line, being separated by a deep fissure. From the left lobe, just anterior to the lower angle of the thyroid cartilage, a small process projects upwards,

* Transactions of the Royal Society of Edinburgh, vol. xxii. p. 320.

† This specimen is in the Museum of St. Bartholomew's Hospital.

‡ See also specimens Nos. 2 and 3.

§ See also specimen No. 6.

and resembles the base of the process in either figure 6 or 7, wanting the stalk-like continuation towards the os hyoides. The right lobe is somewhat irregular along its upper border; but just where it reaches the middle line there is a lozenge-shaped piece of gland, more closely connected with the right than with the left lobe, from which latter it is separated by a distinct fissure, a faintly marked line extending above for a short distance between it and the right lobe. This lozenge-shaped portion ascends, and is adherent to the lower notch in the middle line of the thyroid cartilage; its extremities are pointed, and the lower one just falls short of the level of the inferior margin of the lateral masses. In another foetus (fig. 11)*, the left lobe, three-tenths and a half of an inch in length, is irregularly and slightly notched. The right lobe, traced towards the middle line, shows scarce a sign of a middle portion; but there is a small distinct mass adhering closely to it, and this narrowing rapidly, becomes over the thyroid a slender band, and can be traced upwards until it ends by adhering to the posterior inferior surface of the hyoid bone.

The evidence obtained from these dissections goes to show that the thyroid is connected, in man, from a very early period with the upper portion of the air-tube. It does not consist, at all events after the seventh week, of distinct lateral masses, and the appearances it presents at that date are in favour of the middle portion being of equal standing with the rest. It is marked out, more or less distinctly, into three principal parts or lobes, but these are united at the seventh week of foetal life and form, save exceptionally, one thyroid body.

The isthmus appears to consist of the smaller middle division uniting the other two, but there may be an absence of isthmus through failure of this union†, the middle portion joining the right or left lobe, and thus making one lateral portion larger than the other, a condition sometimes recognized in the adult; or a small middle lobe may remain distinct (fig. 10), and this, with the various irregularities observable in the lateral portions, may account for the partial and isolated outgrowths of this body in various forms of goitre‡.

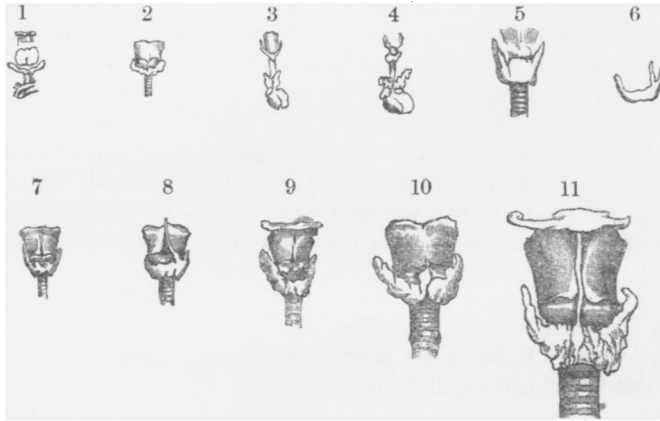
The pyramid of Lalouette may be seen in figs. 6, 7, 8, 10, and 11, where it is drawn as springing from the middle, the right and the left of the thyroid. It is very commonly met with in the foetus, and is clearly an outlying part of the body, of which the buds seen in figs. 7 and 10 are the simplest forms, and the cleft of the left lobe in fig. 6, or the distinct process in fig. 8, the larger development. Just as the cornua of the thyroid body are fixed by fibrous tissue to the wings of the hyoid bone, so also, as would be expected, any one of these processes is equally fixed to one of the adjacent cartilages, or, if prolonged upwards, to the os hyoides, as in

* See also specimen No. 7.

† See Sir Astley Cooper's specimens in the Museum of the College of Surgeons, O. 38.

‡ In the Museum of the College of Surgeons is a specimen showing enlargement of the middle lobe of the thyroid, No. 1504.

fig. 11. In the adult, the pyramid is less often met with than in the fœtus. I found it in some form or other, in ten out of forty-two adult male subjects, in the fœtus four times in eight. Thus it is probable that these out-growths from the fœtal thyroid often shrink and disappear with advancing years.



Explanation of Figures.

Fig. 1. Thyroid from human fœtus (eight-tenths of an inch long), about three times the natural size.

Fig. 2. Thyroid from human fœtus (two inches and eight-tenths long), natural size.

Fig. 3. Thyroid from fœtal rabbit (eight-tenths of an inch long), about three times the natural size.

Fig. 4. Thyroid from fœtal pig (one inch and two-tenths long), about three times the natural size.

Fig. 5. Thyroid from fœtal hare (six inches long), natural size.

Fig. 6. Thyroid body from human fœtus (three inches and nine-tenths long).

Fig. 7. The same (four inches and three-tenths long).

Fig. 8. The same (four inches and six-tenths long).

Fig. 9. The same (six inches and four-tenths long).

Fig. 10. The same (eight inches and seven-tenths long).

Fig. 11. The same (twelve inches long).

Figs. 6-11 are drawn, by measurement, the exact natural size.